

S/N 10/806,367
Vincent C. Moyer, et al.
Atty Dkt: 10040349-1

REMARKS

Claims 1-27 were pending in the application prior to this response. Claims 1-27 remain in the application unchanged by this response. Re-examination and reconsideration are requested.

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I. **Rejection of Claim 6 Under 35 U.S.C. §103(a)**

Claim 6 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Jackson (U.S. Patent No. 4,794,384). Reconsideration of the Examiner's rejection is respectfully requested.

Applicants' claim 6 recites the following:

A method of detecting contaminants with an optical mouse, the method comprising:
aligning an optics module of a mouse with an imaging surface;
obtaining a first image of the imaging surface, via application of substantially coherent illumination from the optics module to the imaging surface;
analyzing the first image to identify an interference pattern associated with a contaminant; and
identifying the interference pattern as a contaminant if a parameter of the interference pattern exceeds a threshold value.

(bold emphasis added)

In applicants' last response (filed August 3, 2007), applicants argued that the claim 6 limitation "analyzing the first image to identify an interference pattern associated with a contaminant..." is neither disclosed nor suggested by the Jackson reference.

On page 6 of the final Office action, the Examiner responds to this argument as follows:

The examiner disagrees with Applicant assertion. Jackson clearly states that analyzing an image to identify an [interference] pattern associated with

contaminant (See col. 4, lines 25-31. Please note that the “diffused object” is the same as applicant’s “contaminant”).

Applicants disagree with the Examiner’s interpretation of the Jackson reference and respectfully request that the Examiner reconsider the present rejection for the reasons discussed below.

The Examiner takes the position that the Jackson reference uses the term “diffused object” to mean a “contaminant” as recited in applicants’ claim 6. The Examiner points to column 4, lines 25-31 of Jackson in support of this position. This portion of Jackson is reproduced below, along with the remainder of the paragraph in which it appears (in order to provide expanded context for the term in question).

It is well known that a speckle pattern is formed by the interference of coherent light scattered from a diffused object. The scattering is caused by the inherent irregularities natural to a surface. The interference caused at such surface will be constructive or destructive. In the case of constructive interference, the light waves will add in intensity while in the case of destructive interference, the light waves will subtract in intensity. This pattern of interference will create light and dark features in the back scattered illumination which is referred to as a speckle pattern.

(Jackson, column 4, lines 25-36, italic emphasis added corresponding to lines 25-31 cited by the Examiner)

In the above paragraph, Jackson discusses the well-known principle by which an interference (or “speckle”) pattern is formed when coherent light is reflected by a surface having inherent irregularities. When read in proper context, it is clear that Jackson uses the term “diffused object” to refer to an object having a surface with such irregularities. Elsewhere in the reference, Jackson generally discusses the fact that an irregular or rough surface is necessary to create the interference pattern:

The speckle pattern reflected from surface 14 scatters back to the detector array 16. At any given observation point on the detector array 16, the intensity of the back scattered light is the sum of all of the light waves reflected from the surface 14 back to this observation point. These waves arrive at the observation point in or out of phase with each other depending on the total path length from the source 12 to the detector array 16 via surface 14. This path length is modified due to the **natural roughness or irregularity inherent in reflecting surface 14.**

(Jackson, column 4, lines 47, bold emphasis added)

For example, surface 14 may be the surface of a desk or other such surface of sufficient reflectivity level to sensitize the detector array.... **Highly reflective surfaces, such as mirror surfaces, are not suitable for the purposes of this invention. There must be some light scattering capabilities due to surface roughness,** as an example, a surface roughness on the order of at least onehalf wavelength of the light produced from light source 12.

(Jackson, column 4, lines 2-14, bold emphasis added)

Thus, Jackson uses the term “diffused object” to refer to an object having a surface with irregularities (or roughness) sufficient to scatter or diffuse coherent light reflected therefrom and form an interference pattern (as opposed, for example, to a flat mirror surface which lacks light scattering capabilities). The diffused object may, for example, be a surface of a desk over which the device is moved, so long as the surface has sufficient inherent irregularities or roughness. Jackson does not use the term “diffused object” to refer to a “contaminant” as recited in applicants’ claim 6. Accordingly, there is no disclosure or suggestion in the Jackson reference of analyzing an image to identify an interference pattern associated with *a contaminant* as required by applicants’ claim 6.

In applicants' response filed August 3, 2007, applicants also argued that the claim 6 limitation "identifying the interference pattern as a contaminant if a parameter of the interference pattern exceeds a threshold value" is neither disclosed nor suggested by the Jackson reference. On page 6 of the final Office action, the Examiner responds to this argument as follows:

The examiner again disagrees with Applicant. Because Jackson discloses (col. 4, lines 25-27) that "a speckle pattern is formed by the interference of coherent light scattered from [a diffused] object."

Here, Jackson states that identifying the interference pattern as a contaminant (diffused object). In col. 6, lines 30-35, Jackson clearly states, "Since the speckle pattern being sampled can, in a sense, be thought as composed of equal [mixtures] of light and dark features, the sample window can be determined [complete] when the accumulated photocurrent for half of the detector cells have [exceeded] a predetermined threshold."

At the outset, as discussed above, the term "diffused object" is not used in the Jackson reference to refer to a contaminant. As correctly pointed out by the Examiner above, Jackson *does*, however, generally use the term "predetermined threshold" in column 6, lines 30-35, as reproduced above. Clearly, however, Jackson discusses using a predetermined threshold of accumulated photocurrent *to determine a sample window*. There is no disclosure or suggestion whatsoever in Jackson of identifying the interference pattern *as a contaminant* if a parameter of the interference pattern exceeds a threshold value as required by applicants' claim 6.

For at least the reasons advanced above, applicants respectfully assert that a *prima facie* case of obviousness has not been established with respect to claim 6. Again, it is respectfully requested that the Examiner reconsider the current rejection of claim 6 in view of the arguments presented above.

II. Rejection of Claims 1, 17, 18 and 20 Under 35 U.S.C. §103(a)

Claims 1, 17, 18 and 20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Jackson (U.S. Patent No. 4,794,384) in view of Chang et al. (U.S. Patent Application Publication No. 2004/0246232). Reconsideration of the Examiner's rejection is respectfully requested.

Claim 1

Applicants' claim 1 recites the following:

A method of neutralizing contaminants for an optical mouse, the method comprising:

providing a mouse containing an optics module including an at least partially coherent light source with at least one surface of the optics module exposed to an opening of the mouse; and

interposing a barrier in the mouse between a contaminant and the at least one exposed surface.

Applicants respectfully assert that the rejection of claim 1 is improper because there is no motivation to combine the references as proposed by the Examiner. "It is insufficient to establish obviousness that the separate elements of the invention existed in the prior art, absent some teaching or suggestion, in the prior art, to combine the elements." *Arkie Lures, Inc. v. Gene Larew Tackle, Inc.*, 119 F.3d 953, 957, 43 USPQ2d 1294, 1297 (Fed. Cir. 1997).

Claims 17, 18 and 20

Applicants' independent claim 17, as amended herein, recites the following:

A contaminant-resistant optical mouse, the mouse comprising:
a housing having a surface with an opening;
an optics module including a substantially coherent light source disposed within the housing with at least one surface of the optics module exposed to the opening of the housing; and
a barrier structure between the at least one exposed surface and an environment external to the opening.

Claim 17 has been amended herein to correct a minor typographical error.

Claim 17 is allowable for at least the same reasons advanced above with respect to claim 1. Claims 18 and 20 are allowable at least as ultimately depending from allowable base claim 17.

It is noted that, in applicants' last response (filed August 3, 2007), applicants presented the above arguments with respect to the rejection over Jackson in view of Chang et al. It does not appear, however, that the Examiner has addressed or responded to these arguments in the final Office action. Applicants herein re-assert these arguments and respectfully request that the Examiner reconsider the current rejection in view of these arguments.

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III. Rejection of Claims 2 and 18 Under 35 U.S.C. §103(a)

Claims 2 and 18 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Jackson (U.S. Patent No. 4,794,384) in view of Chang et al. (U.S. Patent Application Publication No. 2004/0246232) and further in view of Bean et al. (U.S. Patent Application Publication No. 2002/0180880). Reconsideration of the Examiner's rejection is respectfully requested.

Claims 2 and 18 are allowable at least as ultimately depending from allowable base claims 1 and 17, respectively.

IV. Claims Withdrawn From Consideration

Claims 3, 4, 5, 7-16, 19 and 21-27 remain pending in the application; however, these claims have been withdrawn from consideration.

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For at least the foregoing reasons, applicant respectfully asserts that all of the active claims are in condition for allowance.

Respectfully submitted,
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Date: November 1, 2007